Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

Vol. 4. New York, May 26, 1849. No. 36.

THE
Scientific American.
THE
BEST MECHANICAL PAPER IN THE WORLD.
CIRCULATION 12,000.
PUBLISHED WEEKLY.
At 128 Fulton Street, New York (Sun Building,) and 13 Court Street, Boston, Mass.
By Munn & Company.
The Principal Office being at New York.
Barlow & Payne, Agents, 69 Chancery Lane, London.

TERMS---$2 a year---$1 in advance, and the remainder in 6 months.

Poetry.

I WILL ARISE AND GO UNTO MY FATHER.

When burdened is my breast,
When friendless seems my lot
When earth affords no rest
And refuge I have not;
Father! if thou wilt suffer me,
I will arise and come to thee.

When conscience thunders loud,
When sins in dread array
Upon my memory crowd,
And fill me with dismay?
E'en then there yet is hope for me,
Father! I'll arise and come to thee.

When I have wandered far,
Along the downward road,
And mountains seem to bar
My turning back to God.
Yet glancing once on Calvary,
Father! I'll rise and come to thee.

And if I am a child,
But have back-slidden still,
And filled with projects wild
Have followed my own will;
Yet, penitent, resolved I'll be,
Father! to rise and come to thee.

With broken heart and sad,
I will retrace my way,
And though my case is sad,
Thy mercy is my stay;
With Jesus's blood my only plea,
Father! I'll rise and come to thee.

And thou in love will turn
To thy poor rebel child;
Nor let thine anger burn,
Though sin my heart beguiled;
Thy voice shall meet me graciously,
Arise! arise! and come to me.

And when my cheek turns pale,
And when I sink in death,
Though heart and flesh may fail,
With my expiring breath
I'll whisper Jesus died for me;
Father! I rise and come to thee.

The Prophet-Child

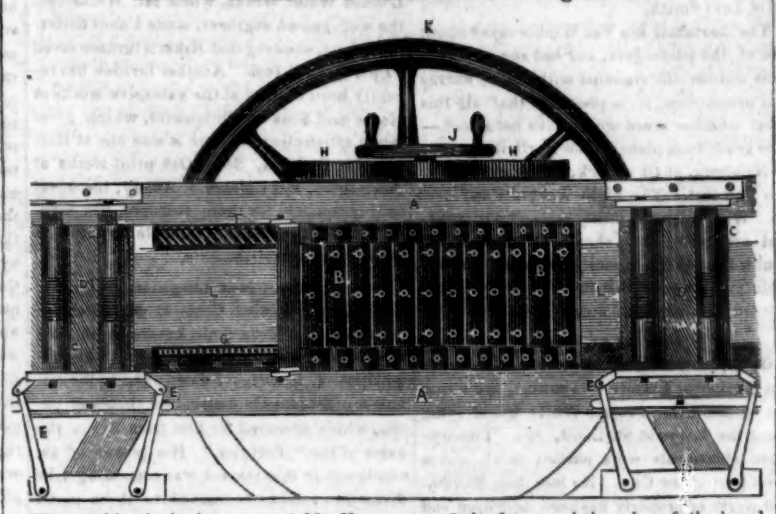
WITHIN the Temple slept the child,
The after-prop of Israel's fame.
When o'er his slumbers, calm and mild,
The summons of Jehovah came.

The call was heard, the child awoke;
With beating heart and bending knee
The future judge and prophet spoke,—
"Speak, Lord, thy servant heareth thee!"

Oh when we hear Jehovah's voice
Breaking the slumber of the soul,
So may we rise, and so rejoice,
So bend our will to His control!

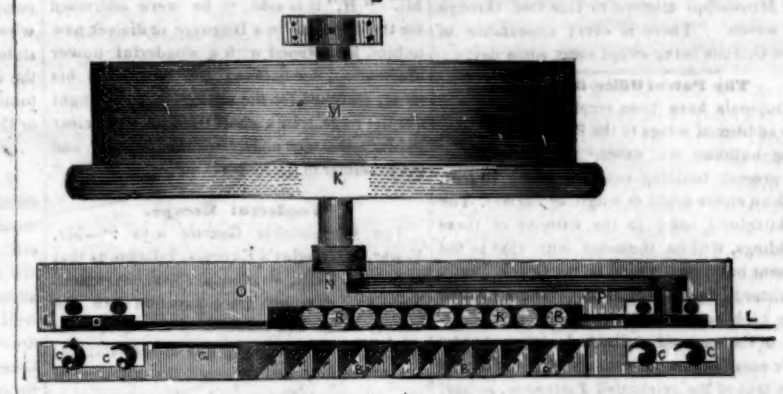
His summons calls us even now;
Oh, may each instant answer be,
"Father, to thy commands I bow,—
Speak, for thy servant heareth thee!"

LAW'S PLANING MACHINE.---Figure 1.



This machine is the invention of Mr Harvey Law of Wilmington, N. C., the inventor of the Stave Dressing Machine and Jointer, which have appeared in our columns. The invention consists in feeding the boards edgeways to stationary planes and tongueing and grooving cutters, but feeding the said boards in a peculiar manner, to lessen friction and perform work like hand work. Fig. 1, is a side view and shows how the board L, is fed in. Fig. 2, is a horizontal section showing part of the frame and the edge of the board, as seen by looking down on the machine. Fig 3, is a side view of the grooving knives and fig 4, is a side view of the tongueing knives. —The same letters of reference indicate like parts. A is the frame work on which the machine is erected. B, is the series of planes secured by screws to triangular blocks as seen in fig. 2. L L, is the board fed in between the planes B, and friction rollers, R on the other side opposite the planes, the ends of which

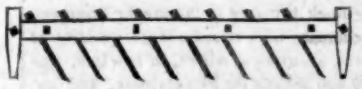
Figure 2.



are seen in fig. 2. F, fig. 1, are the grooving cutters, (stationary) and G, fig. 2, tongueing cutters, stationary also. Figures 3 and 4, represent the tongueing and grooving knives by themselves, and in fig. 1, they are represented as operating on the board L, after it has been planed.

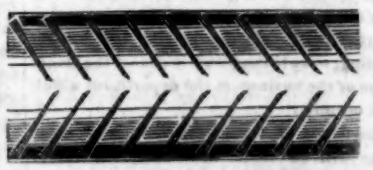
The feeding is done by reciprocating clamps or lappets, connected to a sliding plate operated by the pitman There are two sets of clamps C, C, one set at the discharge end and the other at the entrance. Fig. 1, shows the position of the feed clamps but fig. 2, shows the form better. C, C, are the clamps and D is a face plate opposite to them secured on the same plate, with a space between for the board L, as seen fig. 2. These clamps with

FIG. 3.



the plates have a reciprocating motion communicated by the connecting rod P, from the crank N. G, is a conecting rod, which from P, moves the discharging clamps. E E, fig. 1, are flexible arms, like parallel rulers, secured to pivots below, and to the axis of the clamps above to give them a steady reciprocating motion. O, is the bed plate on which the feed motion is secured. K, is a fly wheel, and M, fig. 2, a drum to drive the machinery by band. On fig. 1, there is a small wheel J, secured on a small vertical shaft, on which is a pinion that meshes into cog wheels H H.—On the shafts of these cog wheels under the ends of the planes are two cams which increase or lessen the distance between friction rollers R R, and the planes B B, to suit the planing operation to boards of different thicknesses. Set screws may also be used for this purpose.

FIG. 4.



From the engravings presented and the description given, a knowledge of the principles of this machine's operation will be imparted to our readers. We have endeavored to do this clearly, by presenting views that would show its operation in the simplest manner.

Mr. Law now resides in this city, No. 216 Pearl street.

Census of Charleston, S. C.

The census of Charleston just completed, shows the total population to be 26,451—white, 14,187; free colored and slaves, 12,264; which on a comparison with the United States census of 1840, shows a deficit of 2810. The number of houses are given: those intended as dwellings, 2789; total for all other purposes, 3147.

RAILROAD NEWS.

Railroad Accidents.

Accidents on Railroads are now daily occurrences, and some days quite a number take place; but the most singular and those which occur most frequently, are deaths by striking the head against a bridge. Almost every day we see a notice of an accident of this kind—We had but just laid down a paper containing an account of this last week, when we took up another and read the following: "Mr. Balcom, baggage master on the Stoney Brook Railroad, was killed on Tuesday, at Groton, by striking a bridge while upon the cars."

It may be no use to call attention to this subject, for it really seems as if brakemen and baggage masters were all determined to commit suicide by beating their brains out against the bridges. We should certainly suppose they knew where the bridges were, and that the fate of others might convince them that, however hard their skulls are, the bridges are till harder."

The above remarks from the Saturday Rambler, are worthy of serious thought to those employed on railroad cars. Accidents of this kind have been to our knowledge, very frequent, and it is but about two years since, that we were eye witnesses to the death of a brakeman caused by striking a bridge in the vicinity of Worcester, Massachusetts. Persons cannot be too careful while travelling over a railroad.

Railroad Law Case.

William Cushman and Wife, versus. Western Rail Road Corporation, before the Supreme Court, at Worcester Mass, last week, Chief Justice Shaw on the Bench.

This was an action for injury sustained by the wife in leaving the cars at the East Brookfield station. The plaintiff's charged that sufficient time was not allowed for the leaving of the cars—that consequently she was obliged to leave while the cars were in motion, and in so doing fell upon the platform and received personal injury by the fall. It was testified that the train had been detained by an accident near Boston, and the Conductors were endeavoring to regain lost time; and passengers stated that undue haste was made in starting the train. This testimony was contradicted by a number of witnesses, most of whom are persons in the employ of the R R. Co. The verdict was for the plaintiff, with $400 damages. Motion was made by the defendants for a new trial on the ground that the verdict was against the evidence, but the motion was denied.

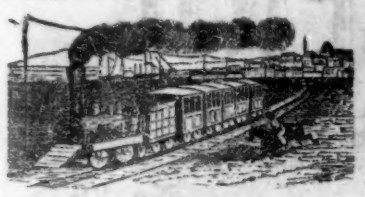
A Railroad from Halifax to Vancouver's Island.

The idea of a railroad to the Pacific, across the Northern British possessions, is one that has been broached by British statesmen. An article in the Army and Navy Register, advocates the immediate construction of such a road, and alleges that the British Government has taken the matter already into serious consideration.

But as there are matters in Canada, which have first to be settled in reference to a far more serious question than a railroad, it is no doubt past a probability to engage in a Canadian Pacific Railroad for some time, and besides it will take 50 years more of progress on the North and North West of the Lakes to make such a railroad pay.

Steam Boiler Explosion.

At Troy, N. Y., on the 15th, the boiler of a steam drill used for dredging out rock in the river at the the foot of Albany street, blew up with tremendous force scattering the fragments in every direction. The only person injured was Nelson Sawyer, a colored man, who was in charge of the boat at the time, and he not dangerously.



Seditious Placards.

The recent riot in our city, resulting in the death of so many human beings, may, in a great measure, be attributed to inflamatory placards which were posted up in the streets, and which were calculated to excite the hostility of one portion of our citizens against another. The police should take charge of every person circulating or posting up such anti-republican missives, in order to ferret out the real plotters of mischief. On last Saturday morning, seditious placards were posted up in different parts of our city, the tendency of which was to array hostility against the present appointed Commissioner of Patents. "The trail of the serpent" was visible in every sentence of those placards, for it should surely be a matter of rejoicing to our citizens, that a practical mechanic has been appointed to an office in our Government, which none but a practical mechanic should fill, and which, since our government was established, was never filled by a mechanic before.—*Sun.*

☞We noticed the placards mentioned in the above. The man who got them up cannot be a good citizen, he is a dangerous man to the community and true liberty. He who would stab his neighbor's character by *pettifogging* intrigue, is sure to be unmasked at last. The eye of omniscient justice is upon him. We were sorry to see the names of Prof. Renwick and Gen. Harvey on the placards. Those respectable gentlemen would loathe the very idea of having the remotest connexion with the author or authors of the placard. We hope that none of those gentlemen who met at the American Institute had any thing to do with the matter, although from the language of the placards, coarse, crude and blustering, there is ground for suspicion, as some facts were referred to in the handbills, which none could know but a person who attended or received word from one who attended the caucus of certain professed inventors. The information was quite new to us. We have said all that we mean to say in regard to the new Commissioner of Patents, only this, that his appointment meets the views embraced in the resolution of the National Convention of Inventors, which was held this Spring in the city of Baltimore. In conclusion, we speak the honest convictions of our heart, when we say, that no man is fit to be an American citizen, who attacks his neighbor's character either in placard or paper and has not the courage to subscribe his name to the same.

Boston Cultivator.

Our worthy contemporary, the Boston Cultivator, is not quite so careful in giving just credit to its cotemporaries as it should be, especially for known original articles. It does not sit well upon our stomach to see the N. Y Farmer and Mechanic get credit in last week's Cultivator for an "Ingenious Key," and to see three of our original articles supporting the credit of the "Ingenious Key," (which is ours) on their shoulders. In the previous Cultivator, the Artisan got the same honor paid to it at our expense. We do not care whether the Cultivator gives us credit for such things or not, in the matter of a fair exchange, but we don't like others to get credit for our labors; and there is not a week lately, but some article is miscredited in the same way.

A Good Month's Work.

There was spun at the Cotton Mill of Charles Danforth, Paterson, N. Jersey, (Wm. Atherton Superintendant,) as four week's work, ending Feb. 10th, 1849 on 20 Danforth or cap frames, numbering 2 616 spindles 514,-620 skeins, all warp, making a daily average of 8,197 skeins per spindle. Number of yarn 21,3. The machinery is of Charles Danforth's new and improved kind. Paterson time of working is 69 hours per week.

The above great months work, we re-insert to add "that it has been derived from an unquestionable source.

Afflicting Events.

The tolling of the funeral bell which woke its sad notes for the deceased who fell at the Opera House, had scarcely died upon our ears, when the afflicting news reached the city informing us that the steamboat Empire was run into and sunk by a schooner. At the time of writing this the bodies of ten drowned persons have been recovered from the wreck, and the Coroner's Jury have given a verdict, the sum of which is, that this deplorable loss of life was occasioned by the recklessness of the pilot Levi Smith.

The steamboat Rip Van Winkle saved about 200 of the passengers, and had she not been near and her office s acted with heroic energy and promptness, it is probable that all this great number saved would have been lost.—The event took place on the North River near to Newburg, at 10 o'clock, on the evening of the 17th inst. The night was clear and starry. What a responsibility rests on our pilots and engineers, they should be men of undoubted integrity, capacity, coolness, and humanity. We hope that this case will be considered criminal negligence.

Fire at St. Louis.

On the same night and at the same hour the Steamboat Empire was sunk, a fire broke out on board the steamer White Cloud lying along the Levee at St. Louis, Mo. Twenty-three steamboats were burned down and a great part of the City. No less than $5,000,-000 worth of property has been destroyed and three persons killed. The fire was not stopped till next day, and houses had to be blown up for that purpose.

Watertown.

A fire took place at Watertown, N. Y., last week and $250,000 worth of property destroyed, this is a vast amount considering the size of the place.

New Orleans.

The city of New Orleans has been almost deluged by the banks being swept away, and the Mississippi allowed to ride free through the streets. There is every appearance of New Orleans being swept away some day.

The Patent Office Building.

Proposals have been received for building two additional wings to the Patent Office, each wing building will extend from each end of the present building east and west, 70 feet, with an entire depth or length of 290 feet. The architectural order in the exterior of these buildings, will be the same with that in the present building, which is the Greek Doric, composed of a series of antæ (pilasters,) raised on a high basement, running the whole circuit of the exposed walls, and surmounted by their entableture, corresponding in its details with that of the celebrated Parthenon, in harmony with the whole building, the design of which was furnished by Mr. Elliott. The West wing is for the accomodation of the Patent Office, in all its details and departments, and made fire-proof.

In the upper story, a gallery will extend round the entire room, supported by columns, and the walls prepared for the reception of works of art, to be lighted from above. With both of these wings, on every floor, a communication will be opened with the present building, so as to constitute it one for the transaction of the business of the department which shall occupy it.

The facing of the exterior walls of these wings will be white marble, and the roof covered with copper, as in the present building.

Boston and Albany.

A correspondent of the Newark Advertiser, in speaking of Albany, says: The general outline of the city resembles in many respects that of Boston. The State Houses occupy similar positions. They are both vast business centres. They both sit upon hills; their merchants are princes; their institutions of learning are numerous and of a high order; there is an enterprise too in the population which seeks comparison.

We learn by Telegraph that Major General Worth of the U. S. A. died with the Cholera on the 7th inst., at Antonio de Bexar, Texas. His loss will throw the pall of sadness over the whole country.

An American Invention in England.

The London Patent Journal, Barlow and Payne's, mentions the American Invention of Henry F. Baker, of Boston, Mass., and says that it "is likely to prove very valuable and highly profitable to the Inventor"

The invention has been patented in England, and is a steam boiler furnace, which is not only capable of effecting a great saving of fuel but an almost total consumption of smoke, which is vastly important. The first furnace introduced was erected last year at the East London Water Works, when Mr. Wicksteed, the well-known engineer, made a most flattering report, showing that Baker's furnace saved 37 per cent. of fuel. Another furnace has recently been erected at the extensive works of Hoyle and Sons of Dukinfield, which gives much satisfaction. There is also one at Hargreaves, Brothers, Broad Oak print works at Accrington, and Colonel J. Amory, the agent in this country for these furnaces, has several orders to supply this valuable invention to other large establishments.

The Great Linguist.

At Rome has died Cardinal Mezzofanti—the celebrated Mezzofanti, known throughout Europe for his extraordinary power in the acquisition of languages, down even to the minutest differences of dialect and shades of patois, which procured for him from Byron the name of the "Polyglot." His power of assimilation in this respect was something like divination; and he is likened to those metal prodigies known as "calculating children," who, to the astonishment of consummate mathematicians, leap as it were at a bound, without education, to conclusions implying the intricate processes of their particular science.—At Rome, where the Propaganda entertains and trains missionaries for and from all parts of the world, and where all living languages are currently spoken, Cardinal Mezzofanti conversed with each man in his own tongue and idiom. Curious things are spoken of this remarkable yet seemingly mechanical gift of his. "If," it is said, "he were addressed for the first time in a language or dialect new to him, he listened with a wonderful power of attention, decomposed the sounds in his mind, searched for the analogies, and sought out the roots. In a short time all was clear to him:—he was master of the lexicon and the grammar of the hitherto unknown tongue."

Wonderful Escape.

The Philadelphia Gazette says:"—Mr. Foster, of Longley's Express, informs us that at Salmon Falls, on Monday, four workmen, building a chimney, (in connection with the mills,) which had reached to the height of sixty feet, by the giving way of the staging, the whole four fell through the interior of the chimney to the ground. They were laying the finishing stone, and that went through and they after it. No one was killed, and but one badly injured. One of them got up and walked off, as unconcerned as though nothing had happened. It was a most miraculous thing that they were not all killed."

These men knew the science of escaping from danger. We have known two or three instances of masons saving their lives in the same way. If a man is on a chimney and it commences to fall, let him slide down inside, for that is the only loop hole of escape. Brick builders all know this.

Lead Mines.

The S. W. and Arkansas Mining Company have a large number of teams running between the mines and the river bank opposite Little Rock, bringing in the ore for shipment. The company have raised a large quantity of mineral, a portion of which, in two lots, one of 400,000 pounds for Philadelphia, and another of 100,000 pounds for Liverpool, England, will be shipped in a few weeks. Preparations are being made by the company to erect within a month, extensive smelting and cupelling furnaces for reducing the ore and extracting the silver from the lead.

Explosions.

We have received by the Boston Traveller, the Report of the Boston Society of Civil Engineers on the explosion of the Locomotive Piscataqua. As it a singular case, we shall notice it next week.

Spirit of an Engineer.

The Philadelphia Sun says that the chief engineer of one of the Halifax Steamers lately purchased by the Prussian Government, was a fine stalwart Highlandman, six feet two in stature, and strong in proportion to his unusual height. One day, at Bremen, when our Highlander was on deck, the commander of the new steam-frigate brushed roughly and rudely past him. Resenting the offence, the Scot threatened to knock down his chief if the annoyance were repeated. The insult being again offered, the commander was felled to the deck accordingly. A crowd of men assembled immediately, and meditated the capture of our hero. He, however, armed himself with a double-barrelled gun, and until the consul had been apprised of the occurrence, in his engine-room, kept the whole dastardly crew at bay, threatening to shoot the man who attempted his capture. The affair then terminated peaceably; but the advice of the consul, to save himself from assassination, by a speedy flight, was wisely adopted in good time, by the gallant Highlandman. When questioned whether he would really have shot his opponent, he replied "well, no; but I would have just run the gun-barrel into the first who approached." While referring to this incident, we may mention a fact not yet generally known, namely, that the rescue of the Acadia, when stranded on Ter Schelling, was entirely secured by the exertions—the ability, indeed—of her chief engineer, a Scotchman.

Water Wheel for Mexico.

At the Union Water Works, Paterson, N. J., there is at present in process of construction a water wheel 66 feet in diameter, weighing 70 tons all iron.

It is building for Don Rubio, of Mexico, one of the largest and most wealthy manufacturers in that country, who has probably spent more money to advance the manufacturing interest there, than all others put together.—The wheel is to be finished and put together complete before leaving the Works, and all who are desirous of seeing it in a finished state swung upon its shaft ready to receive the water in its buckets, will have an opportunity of doing so the last week in this month, or the first week in June.

Vancouver's Island.

It is stated that the British Government has determined on forming an extensive depot and naval station at Vancouver's Island in the Pacific. The natural advantages of the position are said to be very great, and the island also abounds with coal. Its soil is also said to be well adapted to farming purposes. The only drawback is the rule of the Hudson's Bay Company which will prove an obstacle to any thing like successful colonization, and a drawback it will certainly prove, as all such aristocratic unrighteous grants have proven. Vancouver's Island will yet be an independent kingdom, but not for a number of years, and in that case it will rule the Pacific Ocean—it occupies the very position to do this.

The Cholera.

We see by several of our exchanges that thers is some little excitement about the Cholera being in this city. It is true that a few cases have occurred, but these cases would have taken place under the same circumstances in any other city. Our city is in a very healthy state—and our citizens have far less fears of the disease than strangers. No inordinate apprehensions need be entertained about the cholera in New York.

American Sewing Silk.

Messrs. Amos Gleason, jr. & Co. of Newport, N. H. have favored us with a sample of sewing silk, which is not excelled by any foreign article we ever saw. Their *black* has the brilliancy of Italian and is equal in texture. Messrs. G. & Co. manufacture all colors and have shown us some of the most brilliant and beautiful shades we ever saw, of American manufacture.

A Literary Lion Coming.

On the evening of a certain day near the close of the year 1849, a solitary man, closely muffled in a large huge cloak, will be seen embarking on board a steamer bound for America. That man is G. P. R. James. So the papers say.

The Mineralogist.—The description and locality of every important Mineral in the United States.

(*Continued.*)

SPECULAR OXIDE OF IRON.

Occurs crystallized, having a steel-gray color; metallic lustre; specific gravity of 5.52. When scratched on the surface it presents a reddish appearance, Infusible; insoluble.—Found at Jamaica, Vt; Hawley, Brighton and Montague, Mass.; Fowler, and near Lake Champlain, N Y.; near Baltimore, Md.

MICACEOUS OXIDE OF IRON.

Occurs in slaty masses of an iron black color; and specific gravity of 4. Brittle; splits; Found near Belfast, Me.; Hawley, Charlestown, Brighton, Mass.; N. Stratford, Ct.; near the Raritan, N. J; Baltimore, Md.; Fort Lee, N. Y.; Madison and Washington Cos. Me.

IENITE, (YENITE OR LIETRITE.)

Occurs massive, and in prismatic crystals, of a brownish black color, and sub-metallic lustre; scratches glass, and gives sparks with steel. Fusible. Specific gravity 4. Found at Chatham, Ct.; Cumberland R. I.

KAOLIN. (PORCELAIN CLAY.)

Occurs massive, of a yellow, or reddish white color, and specific gravity of 2 30. Soft and friable; unctuous; absorbs water; infusible. Found at Monkton, Vt; Washington, Ct.; near Wilmington, Del.; and Philadelphia, Penn.

LAUMONITE.

Is efflorescent zeolite; found in crystals, and crystalline masses, of a white color; lamellar structure. Specific gravity 2 20. Translucent. Scratches glass; disintegrates; fusible; forms jelly with acids. Found near New Hrven, Ct.; Phillipstown, N. Y.

SULPHURET OF LEAD. (GALENA.)

Occurs crystallized, amorphous and composed of crossing fibres with interstices, having a shining, bluish gray color; lamellar structure; specific gravity of 7.50; brittle; soft; fusible; Found at Sunderland, Thetford, Vt.; Southampton, Leverett, Mass.; Middletown, Bethlehem, Huntington, Southington, Ct.; Shawangunk Mt. Ulster Co., Ancram, Livingston's Manor, N. Y.; Perkiomen, 23 miles from Philadelphia, Pa.; Washington, Jefferson, Madison, St. Genevieve Cos. Mo.; also in Ohio, Tennessee, Maryland, Virginia, Indiana, Illinois, Iowa and Wisconsin.

CARBONATE OF LEAD.

Occurs in crystals, masses, spangles, and pulverulent, of a whitish or brownish color; adamantine lustre; specific gravity of 6 to 7.2. Translucent; fusible; soluble. Localities: Perkiomen lead mine, and Lancaster, Pa.; Wythe Co. Va.; Burton, Mo.

SULPHATE OF LEAD.

Occurs amorphous, and in small crystals, of a white, gray, brown, green or red color; lamellar structure; specific gravity of 6.3.—Fusible; yields to the knife; brittle; insoluble in aquafortis. Found at Southampton, Mass.; Huntington, Ct.; Perkiomen lead mine, Pa.

PHOSPHATE OF LEAD.

Occurs in masses, crystals, concretions and crusts; of a greenish, yellowish, brownish or reddish color; shining lustre; specific gravity of 6 to 7; easily yields to the knife; translucent; fusible; brittle. Found at Lenox lead mines, Me.; Southampton, Mass.; Perkiomen lead mine, Pa.

MOLYBDATE OF LEAD.

Occurs crystallized, of a yellowish color; waxy lustre; specific gravity of 5.90; fusible; soft; yields to the knife; brittle. Found at Southampton, Mass.; Perkiomen lead mine.

LIGNIFORM ASBESTOS.

Occurs in masses, much resembling chips of wood, of a brownish yellow color; fibrous structure; specific gravity about 2; opaque and dull; fusible with difficulty. Found at Mount Holly, Vt.; and Newlin township, Pa.

FETID CARBONATE OF LIME.

Resembles in external characters common limestone; color grayish white; burns to quick lime; effervesces with acids; when struck, it gives the odor of rotten eggs. Found at Stockbridge, Mass.; Northford. Ct.; Rhinebeck, Batavia, Niagara Falls, N. Y.; Alleghany Ridge, Md.

By the latest accounts from Europe, it seemed as if there was a complete reaction in favor of monarchy.

For the Scientific American.
National Convention of Inventors.

MESSRS. MUNN & Co

In your valuable paper of the 10th of Feb last, you were kind enough to notice the call of the Inventor's Convention, which was subsequently held in the City of Baltimore; and no doubt but your readers have been apprised that that Convention authorised the Inventor's National Institute, as a central Committee, to call another Convention of Inventors to convene in this city, (Baltimore Md.,) during the coming fall, and previous to the meeting of the next Congress. In exercise of this authority we have called the next National Convention of Inventors, and all persons interested in patents and patent Laws, to commence the 21st of August 1849, during the exhibition (Sept. 27th, to 13th Oct.) of the Maryland Institute, and the Fair (from 10th to 12th Oct.) of the Maryland Agricultural Society. We therefore invite your attention to the matter, feeling that you will aid us in spreading the notice throughout the country, an earnest of which we have, not only in your prize essay upon the Patent Laws, but in your oft repeated "a reform in our Patent Laws is imperative," and the many ways you have advocated the rights and importance of the Inventor.

That the Patent Laws are inadequate to the protection of the Inventor is known to all who are in the least familiar with the history of inventions, in many points 'tis but a mockery, subjecting the inventor to piracy, infringements, frauds, ruinous and interminable law suits.

When we consider, that Inventions, or in other words developed improvements in the mode of accomplishing ends, must keep pace with the growing wants of the world, or want and poverty must ensue, then surely it must be obvious without further reflection that the best interests of trade, commerce, manufactures and society, must be advanced by, not only, giving to the inventor proper security and protection which their products and talents justly entitle them, and which, the Constitution and Laws were designed to afford, which common justice and honesty awards, but a stimulus should be applied, a helping hand proffered; without protection and encouragement it requires but little thought to perceive that discoveries in science, and improvements in the arts will be greatly hindered. Men will not toil, devote their time, fortunes, energy, and intellect in pursuits which promises injustice, spoliations, poverty, insults, robbery and abuse, instead of security, remuneration and honors. To correct these abuses and to foster the inventive talent of our people is the object of the Inventors National Institute, and of the call of the National Convention of Inventors, we would therefore give this timely notice that all so disposed may be prepared to attend the Convention and participate in the measures, or make such suggestions by letter as they may think will promote the welfare of the Inventor and the public weal. All communications should be post paid, and addressed to

JAMES COPPUCH, *Cor. Sec.*
Of Inventors National Institute.
Baltimore, May 11th, 1849.

Miniature Steam Engine.

The smallest steam engine ever made to work by steam was exhibited a short time ago in England. It was by a young man named Jonathan Blankley, engineer at Victoria Foundry, Leeds, and is the most remarkable specimen of minute accuracy and ingenious skill, ever beheld. Though so diminutive that the whole machinery, fly-wheel included, might be placed on a four penny piece, and might be entirely covered by a child's thimble, yet so exact is it in its workmanship, and yet so skillfully contrived in all its parts down to the smallest valve, that it works with the same regularity and certainty as a steam engine of ten horse power. We scarcely need say that a boiler is not included in the above dimensions; but there is every other essential part of the steam engine itself.

John Bloodgood, Esq., is now erecting a building in the upper part of the city of Mobile, Alabama for a cotton factory. It is in a considerable state of forwardness, and by fall every part will be in readiness for operation.

Appropriations by Last Congress for the Encouragement of Science.

For testing the capacity and usefulness of the electro magnetic power, as a mechanical agent for the purpose of navigation and locomotion, and the probable cost of using the same according to the invention of Professor Page, the sum of twenty thousand dollars, to be expended under the supervision of the Secretary of the Navy, in making a practicable experiment of said invention, according to the plan to be proposed and conducted by Prof. Page.

For the construction at the National Observatory of a magnetic clock, under the superintendence of Dr. Locke, and to pay him for the free use by the United States of his invention of said clock, and of all improvements that he may make thereto, ten thousand dollars.

For the purchase of such scientific works as are necessary for the use of the Patent office fifteen hundred dollars.

For compensation of librarian, $500.

For the collection of agricultural statistics and other purposes $35,000.

For defraying the expense of the chemical analysis of vegetable substances produced and used for the food of men and animals in the United States, to be expended under the direction of the Commissioner of Patents, one thousand dollars: which several sums, amounting in the whole to six thousand five hundred dollars, shall be paid out of the patent fund.

For meteorological observations, to be conducted under the direction of the Secretary of the Navy, two thousand dollars. That the Secretary of the Navy be directed to detail three suitable vessels of the Navy in testing new routes and perfecting the discoveries made by Lieutenant Maury in the course of his investigations of the winds and currents of the ocean; and to cause the vessels of the navy to co-operate in procuring materials for such investigations, in so far as said cooperation may not be incompatible with the public interests: Provided, that the same can be accomplished without any additional expense.

For copying abstracts from old sea journals for the 'wind and current charts,' and for payment of duties on books, maps and charts, and instruments imported for the use of the navy, four thousand dollars. And from and after the thirtieth of June next, all books, maps, charts, mathematical, nautical instruments, philosophical apparatus, and all other articles whatever, imported for the use of the United States, shall be imported free of duty, anything in the act of July thirtieth eighteen hundred and forty-six, entitled 'An act reducing the duty on imports and for other purposes, to the contrary notwithstanding.

For nautical books, maps, charts, instruments, and all other expenses of the hydrographical office, fifty eight thousand two hundred and sixty dollars: Provided, that a competent officer of the navy, not below the grade of lieutenant, be charged with the duty of preparing the Nautical Almanac for publication; and that the Secretary of the Navy may, when in his opinion the interests of Navigation would be promoted thereby, cause any nautical works that may from time to time be published by the Hydrographical Office to be sold at cost, and the proceeds therefrom to be placed in the treasury of the United States.

For continuing the publication of the work of the Exploring Expedition, including the salary of the horticulturist and addition to the green house, fifteen thousand dollars.

For completing the geological survey and exploration of the mineral lands in Michigan, Wisconsin and Iowa, in addition to the amount heretofore appropriated for that service, six-thousand dollars.

For publishing an atlas of charts of the surveys of the Northern and Northwestern Lakes made under the various appropriations, under the direction of the Secretary of War, five thousand dollars.

For continuing the survey of the Northern and Northwestern Lakes, ten thousand dollars.

For salaries of special examiners of drugs, medicines, and chemicals, eight thousand dollars; hereafter the New York, shall be two thousand dollars instead of his present salary of eighteen hundred dollars; and that he be allowed a clerk at one thousand dollars per annum.

The above extracts do not include the appropriations of the Coast Survey

Mining in Germany and Great Britain.

The moral and social condition of the mining population of Great Britain is at present a subject of public solicitude. A report on mining inspection in Germany, where a much better regulative system prevails than in England, has recently been presented to the British Parliament, with a view to call attention to some measure of amelioration.

The mining population of Great Britain numbers from seven to eight hundred thousand—and in a social respect, the condition of this laborious portion of the community is no better than that of the slaves of this country, upon whom the English expend so much sympathy. Almost the only step which Parliament has ever taken to raise the moral and physical standard of the degraded colliers and miners, was the prohibition, a few years ago, of the labor of women and girls in the mines, and the regulation of that of boys, who were likewise excluded while under ten years of age. The attention of owners and proprietors has of late years been directed to means of diminishing the dangers to life from effective ventilation and explosions of fire damp, from which causes it is computed that more than 100 lives have been sacrificed annually, for the last thirty years. But as a general thing the miners are left without either secular or religious instruction and almost without Government care in any respect. Evidence elicited by an examination some years ago, shows that the colliers and miners lived in a most wretched manner, their dwellings being distinguished by dirt and disorder; that they were so dirty that people in general would not associate with them; that in fact they constituted a separate class from other people.—Of 400 collier boys examined, few could read—not one in ten knew the alphabet. Boys of 15 or 18 years of age were described as in a state of "heathenish ignorance of the first elements of religious knowledge and betrayed an utter vacancy of mind and complete inability to express their ideas"—a rough, uncultivated, drunken, lawless race.

The mineral riches of Great Britain are immense. The coal annually raised for home consumption and export is 25,000,000 tons, of which London only consumes 1,600,000 tons. The value of this coal is estimated at more than 40 millions of dollars, and it gives employment to 300,000 men. The iron works employ 240,000 men and produce 900,000 tons of iron, of an estimated value of 35 millions of dollars. The tin mines yield about 4500 tons, worth two millions of dollars.—The copper mines produce 14,000 tons, worth seven to eight millions of dollars, and employing 76,000 men. The lead, manganese and other mines employ great numbers. The whole population employed in this vast business is estimated at 750,000 at least, and the material produced is valued at 100 millions of dollars.

In Germany, according to the account to which we have alluded, there are nearly 50,000 miners and colliers, who, notwithstanding the very low wages at which they work (1s. to 1s 6d. a day), exhibit no symptoms of that low sense of moral dignity for which the mining population in England is conspicious.

Among the German miners, drunkenness is by no means common; their houses are neat and clean; their children partake of the advantages of education accessible to all the population; and in general they are a steady, orderly, and industrious people, and not below the level of the rest of the laboring classes in mental cultivation.

The mining districts of Britain are at present in a very poor state. The present wages are not above one third of what they were 15 years ago. Many have left the business for America, Australia and New Zealand, and their places have been filled up with Irish peasantry driven by misery driven from their native land. These are however not regarded as equal in intelligence and morals to those who have left.

The average duration of human life has increased 30 per cent in England in 100 years.

New Inventions.

New Felloe Machine.

Messrs. J S. Rockwood and A. Goodman, of Petersham, Mass. have invented a very valuable machine for dressing and finishing out carriage felloes and for turning out the rims of carriage wheels to a perfect circle. The machine bores, squares and makes felloes of all descriptions, and has a circular saw for cutting off the ends, and a hollow augur for tennoning the spokes, all combined and working on the rotary principle. The felloes are made fast to a large circular face plate which is of sufficient size to receive the longest felloes and the said plate revolves carrying felloes to the cutters, which forms, squares and rounds them. After the felloes are got in readiness for planing and turning, they are then also placed upon the same circular disc mentioned above and made fast, when the said plate is revolved with a slow steady motion which brings the rim of the wheel in contact with two cylinder cutters which turn the periphery of the wheel to a perfect circle and planes the rim to a proper thickness and finishes the felloes in a very neat and rapid manner. The inventors are taking measures to secure a patent.

New Water Wheel.

Mr. A P. Conant, of Fitchburg, Mass., has invented a new Water Wheel, which uses the whole power of the water during the entire revolution of the wheel excepting the spaces devoted to the entrance and discharge of the water. It is a unique wheel in every sense of the word. There are two paddles (that is the best name we can give them) placed on a diametrical axle, which has two cams on it near the centre, on each side of a stationary centre cam that is firmly fixed to the side plate of the wheel. The paddles fit tight in a circular chamber of the wheel into which the water is admitted which acts upon the paddles, carries them round, and when each paddle has come to the discharge opening, after the wheel has completed its revolution, the cam on the paddle axle is acted upon by the stationary cam on the plate of the wheel and the paddle is then what is called "feathered," that is, the edge is turned to a position at right angles with its former position, and the water is discharged and not before.

The main power shaft is secured on a hub, that revolves and is driven by the paddle, acted upon by the water. The paddles might be turned by gearing so as to discharge and turn again to receive the action of the water, but the cams we think are best. Mr. Conant has taken measures to secure a patent.

New Car Coupling.

Mr. N. G. Freeman, of Manchester, N H., has invented a new mode of Railroad Car Coupling, which is both good and ingenious. It is self-acting and is retained so securely that there is no jarring—no fears of shaking apart, and it can be uncoupled in a very short time. It has a hooked tongue that slides up an inclined bar and catches over a cross pin in the coupling box. This cross pin holds the hook firmly and it cannot be relieved but by turning the cross pin which has an eccentric pellet on it, that throws out the hook, and uncouples the cars. The catch pin has a pinion on the outside which is operated by a handle, on the lower end of which is a cog wheel that gears into the pinion to uncouple or fit the catch pin for coupling. If there is danger to be apprehended, the cars can thus be uncoupled in an instant. Measures have been taken to secure a patent.

New Paving.

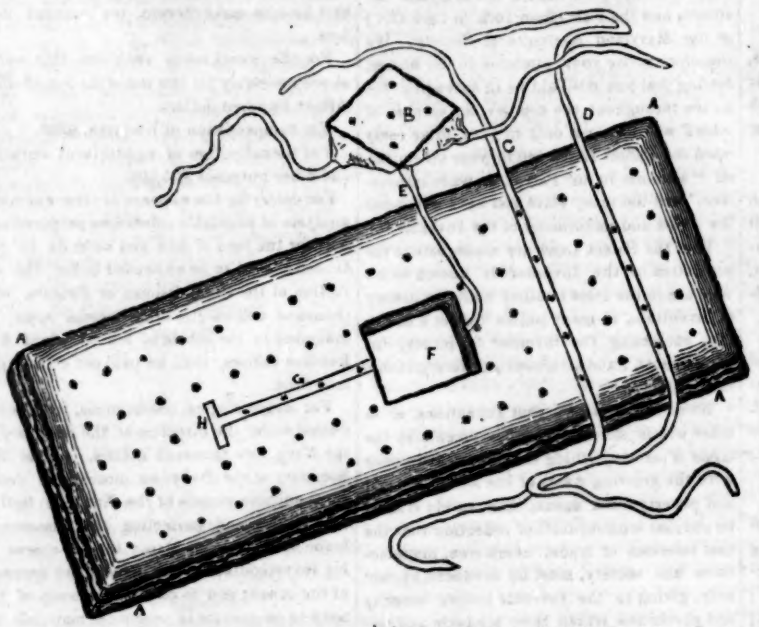
The Artisan of last week has a representation and description of a plan for paving our streets, by Mr. J. Pinkerton of this city, which we think is excellent, far better than any which we have seen proposed before.

New way of Manufacturing Soap.

Mr. Leon Castelain, a Chemist in England, has discovered a new and curious way of making soap from Irish Moss. For every two pounds weight of Irish Moss, he employs 672 gallons of water into which the moss is introduced at the time the water is brought to boil—when the contents are well stirred and the cover put on and the whole suffered to boil for about 10 or 15 minutes. Steam should be used to boil the liquor, and at this period it should be shut off, and the whole allowed to macerate for about three hours, taking care to stir every 20 minutes. The combined matters are then to be drawn off by a faucet at the lower part of the vessel, and strained through basket work which retains the larger pieces of moss. The liquid is next strained through horse hair cloth, and when thus obtained it is run into a vessel in which is placed 4 oz. of common salt to each gallon of the liquid.

These matters are then stirred till the salt is dissolved, when this substance is run into the common soap vessel while the soap is boiling, at the rate of 1 gal. of this liquor to 5 gal. of soap, when both are run into the moulds and produces a soap, firm and excellent for washing. This may be of some benefit to Ireland if on farther practical experience it proves to be as valuable as the patentee says it is.

LIFE PRESERVER MATTRESS.---Figure 1.



This is a Life Preserver Mattress, invented by Messrs. George Shegog and Martin Chapin, of Columbia, in the district of Richland, S. C. Fig. 1 is a view of the invention employed as a mattress, and fig. 2, a view of it employed for a life preserver. The same letters of reference indicate like parts on both the figures. The mattress is made of some kind of stout cloth, as a covering in the common way, and filled up with granulated cork to give it buoyancy at all times, and to keep it dry, and it makes a very fine and soft mattress. A A, is the mattress. F, is an aperture in it, and B, is the square piece that fits into this aperture, it being of the exact thickness of the mattress, but made with side li-

FIG. 2.

nings so as to be a cap and fit on the head of the wearer, when used as a life preserver.—C D, are bands that tie the mattress around the wearer as represented by fig. 2. E, is a band which ties the bonnet to the mattress and G H, is a band and loop to be used with another band if required to tie it snugly.—Fig. 1, shows its application as a mattress and here is John Smith, fig. 2, bound on an aquatic excursion up the Sacramento. Our engraver has put a goatee and *moustache* on John to make him fierce and warrior like among the gold diggers. We remonstrated with him for doing such a thing after what we had said two weeks ago respecting long beards; but it was no use, "John," he said, was not an editor, and we had no right to judge of such adventurous carls by *sanctum sanctorum* rules." Having a desperate aversion to the science of controversial tonguology, we gave up the point, and here John is in a natural state, and we hope to be excused for the absence of the razor, after this honest fair confession. We hope that when Mr. Smith returns from the diggins with 25 lb. pieces, he will not forget old friends. We shall then be happy to repose with him on his famous life preserver mattress and listen to his adventures. Those who know us will warrant him against *bottsification*.

After what we have said, let no person think that we entertain any other opinion about this mattress than a most favorable one. We believe that every ship and steamboat should use it in preference to any other.—Thousands of lives may be saved by it, and it can be made at no great expense and will endure longer than ten straw mattresses, and we believe that it is far healthier than a hair mattress. The inventors have taken measures to secure a patent.

New Vertical Dipping Paddle Wheel.

Mr John Mills, Jr., of Springfield, Mass. has invented a new paddle wheel which operates the paddles to make them dip vertically in the water and then leave the water in a vertical position. The paddles, therefore, move on axles and are allowed by their own gravity to swing free while not in the water, but at the moment they enter the water vertically (which they will do on a perpendicular line with the centre of gravity,) a stout arm on each side grasps the outer side of the paddle and holds it firm while it is passing through the water, then releases the paddle so as not to raise any back water. These stout arms to do this are secured on the radial arms of the wheel and are operated by having their ends revolve in a groove of a stationary eccentric cam, secured around the shaft of the Wheel. The groove in the cam guides the arms that grasp and retain the paddles, to catch and let go the paddles at the exact point required. Mr. Mills has taken measures to secure a patent.

Improvement in the Manufacture of Printing Ink.

Mr. George W. Pratt, of this city has recently secured a patent for England for his improved mode of manufacturing Printing Ink. The invention consists in employing the oil obtained in the distillation of rosin. He uses at the rate of 1 lb. rosin oil, 13 oz of rosin and 5 oz. of yellow soap, melting them thoroughly in a pot over a fire. He uses more rosin if he wants it stiff, or less when it is wanted more fluid. He then suffers this to get cold, and grinds it up with lamp black, or other coloring pigments for variously colored Inks.

Improved Mode of Setting the Spindles of Grist Mill Stones.

Mr. Charles Crofut, of Westport, Conn., has made a good improvement in the manner of securing the top stone to the spindle, whereby it can be taken out in the most simple and admirable manner. There are two clutch grooves secured in the inside to the sides of the stone, and the driving spindle has a wedge passing through it, which sits into the grooves in the flanges, and clutches the stone and spindle together holding them firmly while the stone revolves, but is easily uncoupled to allow the stone to be dressed when required. Mr. Crofut has taken measures to secure a patent

New Chemical Discovery.

A valuable discovery is mentioned in a recent number of the Journal of Pharmacy, of which Mr. Tilghman, of Pennsylvania, is the author. By means of the decomposing power of steam, soda ash is easily made from sea salt, and sulphuric acid from the refuse lime of manufactories. The refuse lime of the gas works can be made to yield back its acids, and is then prepared for use again, and so with the lime of soap factories, in which sulphuric acid is an item of expense, and the lime has heretofore been useless. But, by Mr. Tilghman's process, the sulphuric acid thus wasted is recovered, and the lime, heretofore thrown away, becomes as fit for use again as it was when it was first taken from the kiln.

New Invention.

The Pittsburg Gazette mentions a new invention which the editor calls a Manometer, the purpose of which is to indicate the pressure of steam on every square inch of the boiler. The instrument consists of a glass tube inserted in a bath of mercury and a graduated scale, and performs its office in the most satisfactory manner.

[The Pittsburg Gazette would see by last week's Scientific American that the Manometer was not so very new after all.

Life Boat Cylinders.

A Mr. Bennett has been making some experiments at Nantucket, Mass., with a life boat composed of a number of cylinders. A whale boat loaded with stone, the whole weighing 8,400 pounds, was borne up by 12 of the cylinders, each 5 feet long, and 8 inches in diameter; and it is estimated that, had the cylinders been fully inflated, (as it was they were only partially so) they would have sustained with ease at least two tons more.

We believe that this invention is a good one, but as the Nantucket papers do not state what kind of cylinders they are, we are not prepared to say whether it is new or not. Inflated India Rubber tubes have been employed for the same purpose here.

Curing Bacon.

As soon as the meat is salted to your taste, which will generally be in about five weeks take it out, and, if any of it has been covered with brine let it drain a little. Then take good black pepper finely ground, and dust on the flesh side and on the hock end, as much as will stick; then hang it up in a good, clean dry, airy, place; if all this is done as it should be you will have no farther trouble with it, for by the fly time in the spring, your bacon is so well cured or dried on the outside that flies or bugs will not disturb it.

The above is taken from the Nashville Whig and we speak confidently of its merits both for bacon and beef hams. The process is not new, however, and if some ground cloves and cayenne pepper be added, so much the better.

NEW YORK, MAY 26, 1849.

Pleasures Connected with the Pursuit of Science.

There is no station in life however lowly, but has its sweets, and there is no station in life however high, but has its sorrows. In no instance can sorrow be traced to the pursuit of science. Whatever pleasure it may bring—one thing is certainly true, it brings no sorrows. On the contrary, it a source of enjoyment to every man who has a taste to pursue it, be that man an humble tradesman or a wealthy merchant It is a common opinion that no man is scientific unless he is master of all the abstract knowledge relating to astronomy, mathematics, chemistry, geology, and is somewhat versed in Latin and Greek. But where can we find a man so thoroughly endowed with scientific knowledge. There are many men who have a partial knowledge of these sciences, and we are among the number of those who do not believe in the old adage, "a little knowledge does more harm than good." That man is scientific who is master of his trade—understands all its principles and practices, or is master of his profession, be it teacher of languages or mathematics.—So much for practical scientific attainments. And now what shall we say regarding more knowledge than merely comes the within scope of a man's business and profession. We have every thing to say that is favorable. The more knowledge a man possesses, he is more likely to be a better citizen and member of society. Ignorance degrades, knowledge elevates.

How much pleasure would a shoemaker derive from being acquainted with the principles of the steam engine, or the mysteries of chemistry He could not turn to the right or to the left in the course of a short walk, without having his mind attracted to something interesting and useful, and calculated to draw his mind from the drudgeries of his own occupation, which, we regret to say, often excites our sympathies, as we believe shoemakers are not so well paid for their labor as they should be. And with regard to chemical science, it would teach many of them to labor in better ventillated apartments, than they in general do. How much pleasure would a tailor, or any other tradesman enjoy, if he possessed some knowledge of geology—it makes no matter how little it may be at first, it is of so attractive and pleasureable a nature, that "the little leaven would soon leaven the whole lump." If he takes a walk into the fields, he is delighted not only with the perspective beauties of nature but with its wonders too. The mute rocks speak to him in a well known tongue, and the pebbles by the river side chaunt to him the song of mountain rill, and cataract. He may lift up a grain of the carburet of iron, and his mental eye sees it in the pencil of the artist sketching the outlines of some immortal work of art. He may lift from beneath his feet a crystal of the magnetic oxide of iron, and his mental eye may figure it transformed into the pen of the statesman, or author; or into the sword of the warrior, or the husbandman's ploughshare of peace. He may lift up a blackish brown powder from beneath his feet, and to others it would be as an idle tale, but his mental eye can trace the chromate of iron adorning in orange or gold colors, the turban of the Tartar or the scarf of the fair. Did space permit, we might here branch out into a most interesting and instructive field, but it is as well perhaps that we cannot do so at present, and we believe that it is far better to present objects to make others think, than to deal with subjects in such a manner as to prevent them from thinking.

Would some of our correspondents who have fairly tested the economical capabilities of the condensing, and non-condensing engine, furnish us with the result—the per centage of difference.

Anthracite Coal in Locomotive Engines.

George W. Whistler, Jr. C. E. has made a valuable report on the use of anthracite coal in locomotive engines on the Reading, Pa. Railroad. The Report is a very valuable one in many respects, as it institutes a comparison between the expense of working anthracite coal, and wood burning locomotives; and also brings into notice the workings of a condensing locomotive, which settles the question respecting their utility as locomotives, and bears us out in the opposite theoretical views we expressed a short time ago to a somewhat eminent engineer, viz. that "we believed a condensing locomotive entirely unfit for practical purposes."

The engine Novelty was built with 8 driving wheels 46 inches in diameter, boiler on a separate carriage behind the engine connected with flexible steam pipes, (ball and slip joints) weight of engine 21.5 tons, diameter of cylinder 18 inches, length of stroke 20 inches, area of fire grate 36 feet, fire surface 1085 feet. Placed upon the engine was a cylinder of boiler iron 42 inches in diameter and 18 feet long, having connexion with the water tank immediately behind the boiler. The cylinder of the boiler was for the purpose of giving adhesion (?) to the engine and to act as a condenser for the exhaust steam to heat the water from the tank before it passed into the boiler. The combustion of the coal was promoted by a fan blast.

With respect to this engine Mr. Whistler says, "I was so fortunate as to see it for several successive days under admitted favorable circumstances, and though it made good time over the road, I could but agree in the opinion generally entertained and expressed of its entire *impracticability*." This engine although provided with a condenser and having twice the area of grate of Ross Winans' Baltimore engines, consumed nearly half as much more fuel doing the same work. A large per centage of steam was required to drive the fan blast, and the fire place was too large—there is a right and a wrong size in every thing both for beauty and working. It is an evidence how much is lost in this case by not employing a chemical blower (exhaust steam) in place of transmitting the same power to work fan blast.

BALTIMORE ANTHRACITE COAL ENGINE.

Boiler diameter 42 inches, length of tubes 14 feet, diameter of do 2 feet 8 inches, area of grate 18 feet, 957 feet fire surface, being 110 less than the Novelty's, diameter of driving wheel 46 inches, diameter of cylinders 16.5 inches, length of stroke 20 inches; the draft was regulated by the variable exhaust in the smoke jack; the steam was cut off at the half stroke. This class of engines were built by Ross Winans of Baltimore, and while the condensing locomotive (Novelty,) consumed 10.7 tons of coal per round trip between Richmond and Pottsville, the non-condensing locomotive only consumed 9.4 tons of coal to do the same work.

WOOD LOCOMOTIVE.

Eight drawing wheels 46 inches in diameter, cylinders 15.5 inches in diameter and stroke 20 inches. The area of grate 12 feet and heating surface 875 feet.

The wood consumed per round trip was 14. 37 cords. The cost of wood at $4 per cord would be $57,48 per trip, for coal to the non condensing locomotive $25,85 per trip, and for the non-condensing one $29,42 per trip.—Mr. M. W. Baldwin of Philadelphia, is the builder of the wood locomotives mentioned, and Ross Winans, of Baltimore, the non-condensing coal engines. The expense for repairs in the coal burning engines, however, is more than in the wood burning engines. The fire boxes, grates and other things are sooner destroyed. The whole expense over and above the wood burning engines for one year, Mr. Whistler thinks might be reduced to $375,50 But allowing the expense to be double this amount and calculating the price of fuel as stated above, if one engine would make 100 round trips in the year, the saving in fuel for the coal engine would be near $3000—thus, wood engine each trip $57,48—coal $25,85.—Excess wood $31,63X100 round trips per annum $3,163. Deduct extra repairs $375,50—in favor of coal engine $2,787 50. We have struck the difference in expence between these two classes of engines as presented in the details of the report, and will close this article with Mr. Whistler's conclusive words: "When the difficulties attencing the use of anthracite coal locomotive engines are considered in connection with the entire want of experience with this fuel on a scale adequate to the necessities of the Reading Railroad, it will not be too much to say that the Baltimore engines have been entirely successful as coal burners—the term is but comparative and assigns no limit to the success which I believe will follow well directed efforts to improve such details as passing experience will show to be necessary to insure greater economy of fuel, or greater durability of parts."

The Bridge of Pesth.

This splendid Suspension Bridge—the grandest and greatest in the whole world, and a short description of which we presented to our readers on page 261 this vol. Scientific American, has been destroyed by the Austrian army on its retreat before the victorious Hungarians. In our account (on the page referred to) of this grand structure, it is stated that it was first opened to an army of retreating Hungarians pursued by the imperial army of Austria. The then defeated Huns, rebels though they have been called, had too much respect for the bridge as a work of art to lay a destroying hand upon its stately and graceful proportions, to cover their retreat. Not so with the *legitimate* soldiers called the lawful rulers, as the latest news from Europe informs us, for no sooner had the imperial troops been driven over the Danube, than they turned into ruins this work of Hungarian pride to cover their retreat. Nothing it seems is either too sacred or sublime to arrest the destroying propensities of Austria's minions. Liberty and Art must fall before the scowl and interest of despots. Well, we gave ourselves but little trouble or thought about this war before, but for this wanton destruction of the Bridge of Pesth, by the Austrians. We hope that the Huns, will vanquish both them and their allies the serf army of Russians, which has been called upon to assist the Austrians.

Ohio Mechanics Institute.

The Tenth Annual Exhibition of this Institution will be held in the city of Cincinnati, on the 5th of next September. The exhibition rooms will be open on the 1st of August. The design of the exhibition is to excite among workmen a generous emulation and thereby improve the quality and increase the variety of our manufactures and bring into notice worthy improvements in the arts.

We believe that this Institute is in a very flourishing condition—we wish that we could say as much for the New York Mechanics Institute, but we hope to see it yet standing as it should do "the first in the land." And here let us give a few words of advice. We hope the Institute will take rooms somewhere farther up in the city, in order to suit the convenience of our mechanics, who mostly reside above Canal st. We also hope that our mechanics will come forward in great numbers and join it so as to provide for two regular courses of lectures every winter, viz. Natural Philosophy—Chemistry, and Practical Mechanics.

American Fireproof Safes.

At a fire in Sheffield, England, which destroyed a large establishment, one of Herring's Salamander Safes containing a portion of the books, and as it happened the most valuable, was taken from the ruins safe and sound, while two others of English patent and manufacture were so burned that all their contents were destroyed. The Yankees can go a little further through fire and water than any other "live" people.

Spontaneous Combustion.

The Bucket Factory at Marietta, says the Columbia (Pa.,) Spy, narrowly escaped destruction a short time ago, by shavings becoming saturated with oil from a leaky barrel, and taking fire. The superintendent, to test this, poured over them some oil, and in 1½ hours, the contents and the bucket itself were in a blaze. This fact should be remembered, and carefully guarded against; especially by cabinet makers, chair makers, &c.

White's Patent Hydro-carbon Gas.

As we have seen different articles in various papers respecting this light, we publish the following account of it taken from a lecture delivered by the inventor himself in Manchester, England, and which will correct some erroneous statements which have been circulated regarding the manner of producing it. The gas is made from decomposed water and the way this is done, is by permitting a regular thin sheet of water to fall upon a mass of iron and charcoal contained in a retort heated to redness, by which the water was instantly decomposed. The oxygen of the water combines with the charcoal, forming oxide of carbon, and also with the iron forming protoxide of iron. Hydrogen is given off with the oxide of carbon, but they would of themselves give no light without some other body. The gas which thus arises, is then passed through a second retort where it combines with bicarburet of hydrogen obtained from the decomposition of resin, which thereby forms a pure hydro-carbon gas, free from sulphur or ammonia, and contains no carbonic acid, all of which is found more or less in coal gas. It is conducted direct to the gasometer for consumption.

From a series of experiments conducted for a number of years, it was ascertained that 45 lbs. of resin or fat and 25 lbs. of water would produce in this way 1000 cubic feet of gas, and the fuel according to the price of our coal here would not cost more than 25 cents.

We have often spoken of gas as a good caloric generator to be used for the purposes of domestic cookery in warm weather. Gas derived from the decomposition of water alone without the use of any resin gas, would be excellent for this purpose, for although this gas only produces a blue flame, yet it gives out a great heat and is very pure for cooking purposes. The time may come when we shall use gas for this purpose as well as for domestic illumination. The former idea is less chimerical than than the latter was considered to be, when it was first proposed.

Southern Cotton Mills.

The manufacturers in our Southern States have a special object in view in the employment of factory operatives, viz. to raise the character of what are called the *poor white people* in the South. We believe that in different parts of North and South Carolina and Georgia, there exists a race called the Crackers, Sandhillers, &c. who are said to be descended of the Scottish Highlanders. They are represented as being very poor, and very ignorant, but very acute in making bargains and possessing the peculiar sharpness of the *Gael Albanaich*. They are poor because they consider manual labor degrading and being poor they are also ignorant. They will not work in company with the colored race, but have given good evidence of being industrious and willing to work in factories at mechanical occupations by themselves. This is the class that a number of Southern manufacturers intend to, and do now, employ in their factories. At Graniteville in South Carolina, not far from Charleston, under the able superintendence of Mr. Gregg, a little manufacturing village has lately been built up, where the families of the Crackers, as they are called, reclaimed from their idle lives in the woods, are settled, and white labor only is employed, and the result so far we believe is encouraging.

Prize for a Rotary Engine.

The Society for the encouragemt of National Industry at Paris, have awarded a prize of $10,000, for an improvement in steam engines by which a rotary motion is produced, directly without a crank. We should like to have a sight of it.

Our London Patrons.

We are happy in being able to inform our English patrons that such arrangements have been completed with the London Patent Office that the Scientific American may hereafter be found there. Messrs. Barlow & Payne are agents at 89 Chancery Lane, and will receive remittances on account of the Scientific American from those who may desire to subscribe.

Terms—3 dollars per year and postage paid out of the United States.

LIST OF PATENTS.

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending May 15, 1849.

To Patrick Bryant, of Chesterfield, Mass., for improvement in machinery for cutting and slitting Cheese Hoops, &c. Patented May 15, 1849.

To Joseph W. Webb, of Ledyard, N. Y. for improvement in the cut-off and steam stop of Rotary Engines. Patented May 15, 1849.

To C. L. Scudder, of Brooklyn, N. Y. for improvement in Chimney Caps. Patented May 15, 1849.

To J. L. & H. K. Fountain, of Rockford, Ill. for improvement in Harvesters. Patented May 15, 1849.

To James Brooke, of Baltimore, Ohio, for improvement in Bedstead fastenings. Patented May 15, 1849.

To Homer Smith, of Hector, N. Y. for improvement in Grain Separator. Patented May 15, 1849.

To Jacob Post, of Newark, N. J. for improved Lock for Fire Arms. Patented May 15, 1849.

To Jonathan White, of Antrim, N. H. for improvement in Straw Cutters. Patented May 15, 1849.

To Cheney Reed, of Cambridge, Mass. for improved method of moving and fastening window Blinds. Patented May 15, 1849.

To A. W. Cary, of Brockport, N. Y. for improvement in Packing of Rotary Pumps Patented May 15, 1849.

To J. C. Coult & A. B. Davis, of Philadelphia, Pa., for improvement in Atmospheric Churns. Patented May 15, 1849.

RE-ISSUE.

To Nathan Chapin, of Syracuse, N. Y. for improvement in Atmospheric Churn Dashers. Dated May 9, 1848. Re-issued May 15, 1849.

Ventillation.---Combustion.—Decomposition.

Ventilation is the art of supplying by artificial means, the required quantity of oxygen for respiration, &c. This is to be accomplished by the air containing oxygen forced into the space requiring it, by means of blowing-machines, worked by steam, or other power; thus keeping up the supply of fresh air as fast as it becomes deprived of its oxygen. By this method we do not supply oxygen to that part of the air from which the oxygen has been withdrawn by respiration—that portion still remains deprived of its oxygen—it is, therefore, necessary to remove it, in order to make room for the pure air. This is accomplished by making an outlet for the air at the opposite extremity of the space to be ventilated, to that at which the air enters. Another method depends upon the fact, that air when heated, is rendered lighter, and has a tendency to ascend. To ventilate a space upon this principle, all that is necessary is that the air should have a means of entering at one extremity, and that at the other extremity it should be heated by means of a furnace, constructed in such a manner as to heat the air as much as possible with the smallest quantity of fuel. The more the air is heated, the greater will be the quantity of air that will enter in a given time, into the space required to be ventilated. It is on this principle that some of the largest mines in England are ventilated. They have two shafts, down one of which the air enters, and is directed along the different galleries, by means of doors properly arranged until it arrives at the other shaft, up which it is caused to ascend by a large furnace placed at the top. In this manner, galleries seven miles in length, have been perfectly ventilated by means of a single furnace.

In the construction of furnaces, the object to be attained, is the perfect combustion of the fuel. Now, this can only be arrived at by such an arrangement as will admit of every part of the fuel receiving a sufficient quantity of oxygen, for converting it into carbonic acid and water. If the supply of oxygen is sufficient, no fuel escapes from the funnel or shaft unconsumed. When, therefore, we observed the dense black smoke emitted from some of our factories, &c., we may well express surprise that men, clever in other things, should allow such a slur upon their ingenuity to exist. There are however, many circumstances in the way of improvement in this particular, which render this subject one of considerable difficulty, viz—the want of knowledge, for it is obvious that a furnace requires more oxygen at one moment than at another; also that when fresh coals are thrown in, the supply of oxygen is required over or above the fuel, in order to unite with the volatile matters of the coal; at other times the supply of oxygen is required below, or through the fuel. It is impossible to make a furnace self acting in these particulars, and these are points seldom attended to. The remedy lies with the firemen, when they are properly instructed, the smoke nuisance will no longer exist.

It may be enquired,—if we, and all animals, constantly converting a portion of the atmosphere, into carbonic acid, and if all furnaces and fires, and even common candles or lamps, are also converting other portions of this oxygen into the same carbonic acid, how does it come to pass that the quantity of oxygen in the atmosphere is not so much diminished as to render it unfit for respiration?

Oxygen consumed by respiration and combustion, is converted into carbonic acid and water; now plants decompose both carbonic acid and water—converting the carbon of the one, and the hydrogen of the other, into their own substance, and give back to the atmosphere in a free state, the oxygen previously combined with these. In this manner a constant and uniform supply of oxygen is maintained in the atmosphere.

Oxygen is the cause of the decay or putrefaction of vegetable and animal matter. The oxygen unites with the carbon contained in these substances, to form carbonic acid, and with the hydrogen to form water; the nitrogen contained in animal matter unites, in some cases, with the oxygen, to form nitric acid; in other instances the nitrogen unites with a portion of the hydrogen contained in the decaying substance, to form ammonia—this it is which gives to stale meat its peculiar disagreeable smell. In this way Nature converts the solid matter of dead plants and of animals into gases, which becoming diffused through out the atmosphere, serve as food for living plants, which again decompose these substances, taking from them what they require for their own increase, and giving back to the atmosphere the oxygen employed in the decaying process.

How to keep the Western Waters always Navigable.

In a Communication to the U. S. Gazette, Mr. Charles Ellett Jr. proposes to keep a supply of water in dams to be gathered up in the spring, and let gradually into the rivers, to keep them navigable during the dry months of Summer.

He says, what is needed to make the Ohio and all the great rivers of the West permanently available is a steady and plentiful supply of water. Nothing more. And nature has been bountiful in this also, and has furnished the water and necessary means of making it useful.

These rivers generally dry up in summer, to such an extent that navigation is almost entirely suspended. But an ample supply is furnished during the winter and spring, and annually discharged in destructive floods.

To improve the navigation properly, we must collect this wasted water in the mountain valleys, during the season of over abundance, and discharge it into the streams in the summer, when their sources begin to fail. We must dam up the mountain gorges and form lakes during the melting of the snows, and drain them off again when the summer drought prevails. As we harvest in the summer and store away the crops for winter's consumption, we must collect the rains in the winter and use the surplus water in the summer.

Just as we supply the deficiency of our navigable canals, so must we supply that of our navigable rivers—by the provision of the reservoirs. The greater channel will of course require a greater labor and the formation of larger lakes, and the value of the object will justify the greater cost of execution.

The character of the Ohio, and the topography of its sources, present the means of providing an ample depth of water for the movement of steamers of any desirable draught and the constant transportation of a commerce of any magnitude, that the necessities of society can create. For this purpose considerable lakes must be formed on streams having a moderate descent, running through wide valleys where dams of reasonable height will flood an area of some miles in length and breadth, and collect the waters of a district.

The Ohio in the upper part of its course will not average at low water more than eight hundred or one thousand feet in width. Its length from Pittsburg to its confluence with the Mississippi, is nearly 1000 miles, or 5,000,000 of feet. To raise the surface of the water one foot throughout the whole course of this river, will, then require a volume equal to one thousand times five millions—that is, five thousand millions—of cubic feet.

A reservoir capable of holding and furnishing a supply sufficient for this purpose—that is, for raising the whole surface of the river at midsummer one foot—would be about two miles long, one mile wide, and one hundred feet deep—which is certainly a very considerable lake.

To keep up the depth of five feet in the channel we must then obtain the means of supplying very nearly fifty millions of cubic feet per hour.

A reservoir of two miles long and one mile wide will contain more than fifty millions of cubic feet for each foot in depth. Therefore, to supply the quantity of water which is required to maintain a constant depth of five feet, such a reservoir must be drawn down at the rate of twelve inches per hour, 24 feet per diem; and, if it be 120 feet deep, must be exhausted in five days.

Reservoirs have been formed and used for many years in the canals of Europe, more than 120 feet deep; and there are points on the affluents of the Alleghany, Monongahela and Kanawha, where dams of that height could be constructed for two or three hundred thousand dollars, that would flood an area of eight or ten square miles, and supply water enough to maintain the navigation of the Ohio for a period of several weeks.

The Destruction of the Solar System.

Prof. Nichol of Glasgow University delivered a lecture before the Whittington Club, London, and closed it with the following extraordinary language. "The planets are retained in their orbits, because two opposite forces exactly balance each other. But modern astronomy has proved that there is a power at work destroying their balance. From observations made on the retarded return of Encke's comet, and its gradual approximation to the sun, we learn the existence of a fluid, an ether, which however subtile, tends to diminish the centrifugal force and add to the attraction of the sun. However slowly it may approach, we may yet contemplate the day when this present system shall pass away; not however, into a vast ruin, but in its own beautiful and majestic order, just like a flower, which having adorned the earth, lets drop its leaves when its work is done and falls back obediently upon its mother's bosom.

This Lecture was delivered on the 3d of last month, and at some future time we will endeavor to find room for it in our columns, as it is characterised by all the fervid eloquence and singular simplicity which in general distinguishes the gifted Professor's discourses.

New Cotton Mill.

The Lowell Courier says that the Atlantic Cotton Mill, at Lawrence, is in operation.—The water was let in on Tuesday afternoon, at 6 o'clock, and before eleven the next forenoon, the shafting was connected and moved round in fine style, to the great credit of all hands. In one minute's time, after the first revolution of the shafting, there were twenty four cards set to grinding; 2 looms, 2 spinning frames and one dresser were in operation; and before night, they had a loom making cloth, and one spinning frame making filling.

LITERARY NOTICES.

Godey's Lady's Book for June has been sent us by H. Long & Bro. 46 Ann st. N. Y. It is a real gem, and corresponds admirably with the balmy month for which it is designed.—The embellishments are numerous and exceedingly beautiful. First in order is "Iantha," a steel engraving, illustrated by John Duffie. "View from West Point on the Hudson" "The Italian Flower Girl;" with a pleasant sketch from the pen of Henry G. Lee, which taken in connection may be regarded as the choicest portion of the number. Godey's enterprise through his long association with this publication has *justly* been the theme of praise.

Graham's Magazine for June, is made up of the choicest material in Literature and Art.—"The Star of the Night," is a magnificent steel engraving by Addison. "The Cottage Door," is a beautiful rural scene, and forces upon the mind of city residents a desire for the cooling streams and pleasant groves of country life The engraving is so life like that we almost imagine ourselves enjoying the refreshness of the scene. The representation of Col. Washington at the Battle of Cowpens, is spirited and interesting, and highly creditable to the skill of the artist, Mr S. H. Gimber. This Magazine can be obtained of W. H. Graham, 151 Nassau st. N. Y.

Lindsay & Blakiston, publishers, Philadelphia, have just issued an American edition of Noad's Chemical Analysis, with numerous additions by Campbell Morfit, the able author of "Applied Chemistry." This work is a very valuable one on many accounts both to the experienced chemist and the student. It is one of the *treatises* for the *London Library of Useful Knowledge*, and embraces in a condensed form the qualitative and the quantitative analysis of chemistry. The American edition is very superior to the London one, both on account of the typography and the additions which have been made to it.

Rand.tt's Architect.

Number 7 of this really able and beautiful work is now upon our table. It contains the designs of two cottages, with full specifications and sectional plans. This is a number which every man should have who designs to remove to a new country. It also contains a clear description of the manner of making sun dried bricks, which we shall publish in a future number, as it will be useful information to many of our readers.

By the politeness of Risso & Leese, No. 18 Courtland st. we have been furnished with a superbly executed likeness of Sir John Franklin, commander of the Arctic Expedition in the Polar Seas, whose fate has called forth the sympathy of all. $100,000 has been offered to any company who may be effectual in affording aid to this expedition.

American Mechanics.

The wealth of a well-stored mind, the big hand and the stout arm of the industrious mechanic, are worth more, for the perpetuation of our glorious principles of the government, for the prosperity of our country, that all the gold of the world. Already have their scientific researches—their unceasing and untiring energy—their many inventions—and their numberless improvements in machinery &c., given to our young Republic a glorious name and proud position among the nations of the earth. This class have contributed largely to the wealth and to the fame of our country. Trace it all out—lay bare the thousand secret springs of prosperity—follow up cause and effect as they fall in succession under your observation, and you will find American mechanics and artisans have proved to be in their energetic and industrious career, among the principal agents in effecting American greatness.

Substitute for the Potatoe.

Mr. Bryant, in his work on California, mentions that one of the Kanos Indians presented to him "a root of tuber, of an oval shape, about 1½ inches in length and an inch in diameter. This root is called the prairie potatoe. Its composition is farinaceous and highly nutricious, and its flavor is more agreeable than that of the finest Irish potatoe." Mr. Bryant thinks that with suitable cultivation it will make an excellent substitute for the potatoe. The root which is here described abounds in the fields, even in this portion of the country. It is generally known as the ground nut, and is sometimes procured by children and roasted, esteemed a fine edible.

A New Cheat.

A gentleman in Louisville purchased a fine looking roll of butter, weighing ten pounds; but on cutting it in two after reaching home, all but an inch in thickness of the outside proved to be mashed potatoe!

TO CORRESPONDENTS.

"A. M. K. S. of Geo."—We do not know about Mr. J. R. Remington's patent right—nor did we know before that he had one. Is there not some mistake in the matter?

"J. B. W. of N. C."—The plan of your Hydraulator has been duly examined, and found to be an excellent plan, but not new.—You will find the same arrangement, in Barlow's Dictionary of Arts and Manufactures, figure 1, plate S.

"E. H. M. of Ill."—We have received yours and will correct the mistake next week.

"P. C. I. of N. Y."—In consequence of the great number of improvements in churns we are unable to advise you properly without a model representing the nature and construction of the invention. You must be aware of the difficulty we labor under in deciding without a model or drawing. If you will furnish either of them we will advise you by letter as to the probability of the success of an application.

"W. S. W. of Ct."—Your specifications and drawings were received by Adams & Co's Express last Monday morning. Those minor corrections we had made in accordance with your suggestions and forwarded your papers to Washington on the day of their reception here.

"J. C. R of Ohio."—We have examined into the principles of Mr. C***'s machine and consider it an infringement upon your patent. He is aware of this fact and has assured us that he would not interfere with you in future and hopes you will suspend any further action. We must now ask you if you consider it right to obtain our services free and charge us postage on your letters. We think not.

"S. H. P. of N. Y."—A Caveat gives you one year to experiment, and to perfect your invention, before applying for letters patent, but the law makes no provision for the repayment of any part of this fee, which is $20 in all cases. If you apply for letters patent within 12 months from the date of the caveat, $10 more constitutes the full patent fee. *Then* in case your application should be rejected you can withdraw $20, in due form, but our fees are permanent and are paid for making the necessary drawings, specifications, &c.—$12 received and the name of each subscriber entered for the last half year of this vol. You will find the Prize Essay interesting. We are glad to learn that the Scientific American is so well received.

"H. M. of N. Y."—Yours will receive attention next week.

"W. E. S. of Me."—Your letter containing $10 came safe, and the business will be attended to without delay. We shall endeavor to furnish the kind you want.

"F. M. H. of Louisville."—The drawing of your alleged improvement in fire engines was received and examined. We wrote you a few days after that the plan was not new, and advised you not to spend time or money in making an application. $2 received.

"J. D. G. of Pa.—No examination has been made on your machine as yet, but we should think it nearly time. You must be patient.

"J. C. of Md."—We publish the first communication this week. Your last came at the precise time.

"J. DuB. of Ala."—One copy of Minifie's work forwarded on the 18th inst.; funds received.

"M. L. of Germantown, Penn."—We forwarded on the 16th inst. one copy of the Condensing Engine plate, by Livingston & Fargo's Express, care Mosby & Hunt, Memphis. $5.

"G. V. of Ohio."—Your letter of the 15th inst. was received, and found to be correct.—Back numbers sent.

"S. W. of Miss."—Thank you for these favors. The Doctor's papers have been sent and our agents will reply to your questions soon.

"J. M. S. of Va."—$2 received, for which accept our thanks. You had better advise with some mathematical instrument maker, in regard to your Topographer.

"J. P. C. of N. Y."—You will see on another page a receipt for fastening crayons which we think will answer your purpose, but we know of nothing to put in the ink to make the bronze fast, excepting something that would prevent the ink from working freely.

"S. H. of Mo."—Your communication of the 2d inst. came safe, $5 enclosed. The drawing book and back numbers of the Scientific American were forwarded on the 17th inst. You will find it a very excellent work.

"J. A. of Penn.—Can you not furnish us with a description of your substitute for the crank; we should like to know more about it. No invention is a humbug, we care not how simple. A humbug is something got up to deceive. We never look upon inventions in that light although we may have indifferent views of their real usefulness; of course experiment always settles that question. A paddle wheel has been used that thrust out and drew in its paddles, but your plan to do this may be different from all others.

"D. S. of N. Y." "S & C. of S C." "W. S. W. of Ct." "A. H. of Me." "N. S. T. of O." and "N. T. S. of N. J."—Your specifications and drawings have been lodged in the Patent Office since our last issue.

"C. D. White of Ct."—We directed a letter to you at Hartford on Wednesday last. Let us hear from you early.

Assignments in favor of W M Shaw, of Newark, N. J., Hammond Doane, of Dana, Mass., Frederick Selchon, of N. Y., and E. & T. Ring, of Chesterfield, Mass., are at our office, subject to the order of the parties above named.

The American Inventors Almanac.

In another column will be found an advertisement bearing the above heading, to which we would call the particular attention of our readers and especially the inventive portion of them. The object of the work in which Messrs. Pratt & Co. are engaged as publishers is fully pourtrayed in their advertisement and therefore needs no further explanation. We think inventors who desire to make their inventions public cannot find a better medium through which to advertise their machines with so small an expense than by patronising the worthy object which Messrs. P. & Co. have long contemplated and are now carrying forward. We have availed ourselves of their work in which to advertise largely and we feel confident that we shall be repaid fourfold for the expense incurred. For farther particulars concerning the "Inventors Almanac," address Pratt & Co. post paid, William street, N. Y.

Advertisements.

A New and Beautiful Alloy of Metal.

1st. Into a cupola in which iron has recently been melted, a quantity of zinc is introduced on the top of the charcoal, or it may be coke, the heat of which will soon melt it and cause it to run down through the charcoal close to the sides of the furnace when it comes in contact with the melted iron adhering to the charcoal and sides of the furnace and then combines with it and escapes at the bottom.—This alloy will contain about 4 per cent of iron. This is a cheap way to make this alloy, but it can be made otherwise by introducing 96 parts of zinc into 4 parts of molten iron.

2d. Then take and make another alloy of copper and manganese which have been reduced together in a crucible at the rate of mixture of one-fiftieth of the oxide of manganese to the rest of copper. When these two, the copper and manganese, are thoroughly incorporated in the crucible or melting pot, about one fourth part of the first alloy is to be introduced and the whole covered up with a flux (any of the common kind) to facilitate the fusion and prevent the action of the air upon the compound. This alloy produces a beautiful golden colored metal, capable of being rolled, engraved, and is a far superior substitute for brass or gun metal.

A great variation may be observed in the compounding of these materials for different purposes. For rolling, the less iron used the better, but for casting it is well adapted. The alloy at any rate, is of a fine grain, capable of taking a very high polish if properly manufactured, and is somewhat similar to standard gold. This metal is one of the best ever discovered for the bearings of machinery if a small portion of lead, (say about one per cent) be introduced. It is less liable to heat than brass and consequently there is a decrease of friction, and is therefore more enduring than brass.

By melting the first alloy 6 parts, to 10 of copper and 2 of nickel, a beautiful silvery alloy is the result, which may be cast but not rolled, but can be engraved and receives a very high polish.

These alloys are but recently discovered and just patented in England, this part forming an accompaniment to the patent of Mr Stirling, noticed in our last number. He denominates the alloy British Gold, a kind we believe to be much better than that which used to flourish about so much in print during some of our elections.

To Fix Drawings in Chalk and Crayons.

The Marquis de Varennes has discovered a method, which is equally simple and ingenious, of giving to drawings in pencils and crayons the fixidity of painting, and without injury. He succeeded in obtaining this result by varnishing them on the back, that is, by spreading over the back of the paper an alcoholic solution of white gum-lac. This solution quickly penetrates the paper, and enters even into the marks of the crayon on the other side. The alcohol rapidly evaporates, so that in an instant all the light dust from the crayons and chalk, which resembles that on the wings of a butterfly, adheres so firmly to the paper, that the drawing may be rubbed and carried about without the least particle being effaced. The following are the accurate proportions of the solution:—ten grammes of common gum-lac are dissolved in 120 grammes of alcohol; the liquid is afterwards bleached with animal charcoal. For the same purpose may be used even the ready-made paint that can be purchased at the color shops, containing a sixth of white-lac, and adding two-thirds of rectified spirits of wine. After it has been filtered there is nothing further to be done than to spread a layer of either of these solutions at the back of the drawing, in order to give them the solidity required.

This receipt we think will also fix bronze powder.

Useful Problems.

We have received two very beautiful solutions of the problems answered in last week's Scientific American, in reference to the earth's surface seen from a point at a certain distance above it. Richard Hinchcliff of Ballard Vale, Mass., answers problems 2 and 3, and J. J. H. of Philadelphia, answers problem 3. The answers are the same exactly, and the solutions beautiful and correct. They came after the answers in our last were set up, or we would have published them. We have received a great number of answers to the problems—in fact so many that we have concluded not to propose but a very few more, for the reason that so many were wrong, and it took up more of our time to examine them, than we could well afford to devote to that specific object. Mathematics is a study of such an alluring nature to us, that we are inclined to get too much abstracted from other duties, and hence our conclusion, for prudence sake.

PROBLEM 1.—Given the sides including the right angle of a right angled triangle 16 and 9, to find the diameter of the inscribed circle geometrically?

PROBLEM 2.—A cylindrical vessel whose depth is 12 feet is filled with water and placed at the top of a regular declivity whose angle with the horizon is 20 degrees. Query—How far from the top of the vessel must a hole be made so that water may spout the farthest down the said plane?

Another Cholera Cure.

The following is from a Liverpool paper.

Take three table-spoons full of castor oil, three table-spoons full of the best French brandy, and forty drops of laudanum, mixed well together, and let the patient drink it off. The body must then be rubbed over with a hot flannel cloth. Should the condition of the patient not improve within one hour, and the nails of the fingers begin to get black, administer one table-spoon full of castor oil, one of French brandy, and ten drops of laudanum.—This generally throws the sufferer into a prosound sleep, from which he will awaken perfectly well. This treatment has been proved most effectually in India, where cholera first appeared, and thousands of persons were cured by this simple remedy.

Zinc Pails for Milk.

An article recently appeared in a French paper called the Orleans, stating that several experiments have been tried to find out whether zinc could not be advantageously substituted for pewter or tin for milk pails.—The result has proved that milk kept in zinc pails will curd four or five hours later than that kept in pails of different materials, which allows all the cream to separate. In one of the trials, three zinc pails, each containing two gallons of milk, have been compared with three tin pails containing an equal quantity of milk.

The six pails were filled with new milk on a Monday afternoon, at three o'cleck; at nine on the following Wednesday, the milk in the tin pails was found almost entirely curded, while the curding in the zinc pails had scarcely begun; and the cream could not be removed before two in the afternoon. The cream taken from the tin pail, yielded two pounds of butter, and the other two pounds and a half. The butter made from the cream taken from the zinc pails proved sweeter and more agreeable to the taste than that which had been made from the cream preserved in tin pails.

To Destroy Cochroaches.

Take and mix up some arsenic with boiled potatoes and sprinkle it about the hearth before going to bed. Be sure and sweep any of the crumbs that might be left early in the morning and burn them up, for fear of accidents. The cockroach is very fond of potatoes, and the arsenic kills them, and it is of such a preserving nature that no stench arises from the dead ones. Great care must be taken to avoid accidents.

To Boil Potatoes.

Put them into boiling water, let them remain till they are done, take them out and immediately envelope them in a wet cloth, gently squeezing each with the hand till it cracks sufficiently to let out the watery particles in the form of steam. Managed in this way, almost any potato will be good.

History of the Rotary Engine.

Prepared expressly for the Scientific American.

We again resume the history of the Rotary Engine, and will finish it in a few more numbers. We of course do not include in this, those rotaries that have been published before among the miscellaneous articles in the Scientific American, among which are Cary's rotary pump, on our patent list this week, and Tremper's, the patent for which was issued a few weeks since.

FIG. 60.

HOOVER'S ROTARY ENGINE.

This rotary engine is the invention of Mr. James Hoover, of Lewisburg, Preble Co., Ohio, and it possesses a curious and different way of operating the valve from any that has yet been presented in our history.

The invention consists in working the stop and induction valves by a cam on the fly wheel. A, is the axle. It is attached by arms to the ring B, which moves steam tight by a flange in the annular steam chamber having the convex outside. The annular chamber consists of two parts ground and faced, and united together by bolts like two circular plates, and is stationary, being secured in a proper frame H, is a crooked arm connected with a piston which projects inside steam tight in the annular chamber. Against this piston the steam acts and carries round the ring B, and thus drives the axle. D, is a fly wheel, it is secured on the axle A, and revolves a few inches from the annular chamber F, is the steam pipe communicating with the boiler, and P, is the exhaust pipe. The steam pipe has a flap valve in it turned by a flexible rod secured to the axle of the valve on the other side and to the crooked arm E There is a stop valve or gate which sets steam tight down through G, in the chamber. It is close to the induction opening to let the steam act upon the piston around the chamber. This stop valve must be lifted to let the piston pass, and at that very moment the steam must be shut off. This is done by the cam on the rim of the fly wheel. It is represented by a light mark striking a swinging arm, seen behind the stationary standard at D. This raises the stop valve and at once turns the flap valve and shuts off the steam, when the piston passes the stop valve, and steam opening, and then the cam relieves the valves, the stop drops, and the steam is again admitted. One or two pistons may be used, but one is better than two.

To Correct Sourness in Milk, Cream and Bread.

It is not generally known that the sourness of Milk and Cream may be immediately corrected by the addition of a small quantity of the common carbonate of magnesia, in powder. Half a teaspoonful (about equal to four grains) may be added to a pint of milk or cream, if only slightly sour; a larger quantity in proportion to the degree of sourness.

From two to three grains may be added to every pound of flour to prevent sourness in bread, so injurious to some constitutions.

Carbonate of Soda is sometimes employed for the same purpose, but it communicates a very unpleasant flavour to the bread, and, in the case of milk or cream is worse than the disease.

Headache.

Sage tea is said to be good for a headache. Some people have their headaches cured by fasting and others by feasting. We must place ourselves among the number of those who are never cured by fasting. The head should be bathed once every day; no stimulating drinks should be used, and in all cases persons should have plenty of exercise in the open air.

The Banker's Magazine for May is an excellent number. It is valuable to the Banks and Merchants and instructive to any man. It is edited by Homans & Williams, Baltimore.